EXPLANATION OF SIGNIFICANT DIFFERENCES

SHARKEY LANDFILL

Site Name and Location

Sharkey Landfill
Parsippany-Troy Hills and East Hanover
Morris County, New Jersey

Introduction

The United States Environmental Protection Agency (EPA) presents this Explanation of Significant Differences (ESD) to explain the changes made to the remedy selected in the September 29, 1986 Record of Decision (ROD) for the Sharkey Landfill Superfund site. These changes relate to the landfill closure and ground water extraction portions of the remedy, and are the result of information obtained or developed subsequent to the 1986 ROD.

This ESD is issued in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. 9617(c), and Section 300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR 300.435(c)(2)(i), which contain provisions for addressing and documenting changes that occur to a remedy after a ROD is signed. The ESD and documents which form the basis for the decision to change the response action will be incorporated into the Administrative Record for the site in accordance with Section 300.825(a)(2) of the NCP. The Administrative Record is available for review during normal business hours at EPA Region II, 26 Federal Plaza, New York, New York 10278, (212) 264-8770, and at the information repository near the site in the Parsippany-Troy Hills Public Library at 292 Parsippany Road, Parsippany, New Jersey 07054.

Summary of Site History, Contamination Problems, and Selected Remedy

The Sharkey Landfill site is approximately 90 acres in size and is divided into five separate fill areas: North Fill, South Fill, Northwest-North Fill, Northwest-South Fill, and Southwest Fill. The North Fill is an approximately 26-acre island in the Rockaway River located at the northern end of Sharkey Road in Parsippany-Troy Hills. The South Fill is an approximately 32-acre area adjacent to the Rockaway and Whippany Rivers and the Parsippany-Troy Hills wastewater treatment plant. The Northwest-North and Northwest-South Fills are about 11 and 15 acres in size, respectively, and were originally one fill area. The two fill areas were separated as a result of the construction of Interstate 280. The Southwest Fill is an approximately 9-acre area located along the Whippany River southeast of Ridgedale Avenue in East Hanover.

The site began operating in 1945 and accepted municipal waste material until September 1972. During that time, the landfill also accepted commercial, industrial, and hazardous waste materials. Records indicate that various organic compounds were disposed of at the site, including toluene, benzene, chloroform, dichloroethylene, and methylene chloride, in addition to other "liquid and/or chemical wastes" described as cesspool-type wastes. Although there have been allegations of waste disposal after 1972, the site is believed to have been generally inactive after that date, with the exception of excavation related to the expansions of the Parsippany-Troy Hills wastewater treatment plant.

In September 1983, the Sharkey Landfill was included on the National Priorities List of Superfund sites. A remedial investigation and feasibility study (RI/FS) was conducted from December 1983 to September 1986 to determine the nature and extent of contamination and to develop alternatives for remediating the site. The RI/FS found generally low concentrations of organic compounds, pesticides, and inorganic compounds in soils, and low levels of organic and inorganic contaminants in the shallow ground water at the site. Based on the results of the RI, EPA and the New Jersey Department of Environmental Protection and Energy (NJDEPE) established cleanup goals and objectives for the site. The goals and objectives were to 1) minimize the potential for migration of the low levels of ground water contamination, and 2) minimize the risks to the public from exposure to waste and contaminated soil on the site. To accomplish these goals and objectives, EPA selected a remedy in the ROD, signed on September 29, 1986, which included the following major elements:

- capping of the landfill in accordance with relevant Resource Conservation and Recovery Act requirements, including the appropriate grading of fill areas;
- a venting system for landfill gases;
- extraction and treatment of shallow ground water and leachate;
- surface water controls to accommodate seasonal precipitation and storm runoff as well as erosion control for river banks;
- security fencing to restrict site access; and
- an environmental monitoring program to ensure the effectiveness of the remedial action.

Description of the Significant Differences and the Basis for those Differences

The differences between the remedy selected in the 1986 ROD and the actions described in this ESD relate to the landfill closure and the ground water extraction portions of the remedy. Other portions of the remedy selected in the 1986 ROD remain unchanged.

Landfill Closure

The remedy selected in the 1986 ROD envisioned capping of the entire site based on information available at that time. However, during design of the selected remedy, it became apparent that full capping of all landfill areas was not necessary or appropriate. A reevaluation of site circumstances and conditions has resulted in a more limited capping scenario. As currently envisioned, only those portions of the North and South Fill areas having slopes of less than or equal to three horizontal to one vertical (3:1) will be capped. The remaining portions of these fill areas, as well as the three other fill areas, will be appropriately covered with soil and vegetated, as necessary.

The North Fill and South Fill areas have a much greater elevation relative to the surrounding areas, and have very steep side slopes. These side slopes allow a significantly higher amount of rainfall to run off than do the more mildly sloped top areas. This results in significantly less rainfall infiltration into the fill material through the side slopes, thereby reducing the generation of ground water contamination. Therefore, capping is less necessary on the steeply sloped areas than on the mildly sloped areas since one of the primary reasons for installing a cap is to reduce the infiltration of rain water into the waste material.

Some portions of the side slopes on the North and South Fill areas are already well vegetated. Capping the steep portions of these fill areas would destroy this vegetation which is providing natural soil erosion control. Removal of this vegetation followed by capping and planting of grasses and other shallow-rooted vegetation on the side slopes would not likely be more effective in preventing erosion into the waste material than the existing vegetation. By not capping slopes greater than 3:1, much of the existing vegetation will remain intact, and provide a more extensive base for deeper-rooted vegetation. Areas of the side slopes that are insufficiently vegetated will be covered with soil, as necessary, and will be appropriately vegetated to prevent erosion or exposure of the waste material. Erosion controls, such as terracing, gabions, and rip rap, will be employed as necessary to stabilize steeply sloped areas and other areas needing stabilization.

Because of their high elevations relative to the surrounding area, the North and South Fills have a significant amount of

waste material present above the ground water table in an unsaturated condition. In the currently uncapped state, rainfall infiltrates the mildly sloped areas and permeates through the waste material into the ground water. Capping the mildly sloped portions of these fill areas will limit the amount of water that can percolate through the waste material. This will also reduce the extent to which ground water will mound in the fill material. As an additional measure of control, a ground water extraction system will be installed to limit the migration of contaminants in the ground water from these fill areas.

Unlike the larger North and South Fill areas, the Northwest-North, Northwest-South, and Southwest Fill areas are relatively low-lying with much of their waste material lying below the ground water table or present under somewhat saturated conditions. Capping these low-lying areas would not effectively reduce the degree of contact between the waste material and the ground water. In addition, portions of these fill areas border established or emerging wetland areas. It is believed that capping these fill areas would cause significant adverse impacts to these wetland areas. Therefore, the Northwest-North, Northwest-South, and Southwest Fill areas will not be capped as described in the 1986 ROD, but will instead be covered with additional soil, as necessary, and appropriately vegetated to prevent erosion and exposure of waste material. As with the North and South Fill areas, contaminant migration in ground water from these three fill areas will be controlled, as necessary, through the operation of ground water extraction systems.

In addition to the extent of capping at the site, the type of cap will also be modified. The cap envisioned in the 1986 ROD included a two-foot clay layer to meet the performance requirements of the Resource Conservation and Recovery Act (RCRA) Subtitle C regulations which called for a multimedia cap with a permeability of 10^{-7} centimeters per second. However, the ROD recognized that the cap did not meet the compositional criteria of the RCRA "model" cap in that it did not include a synthetic liner. The synthetic liner was not believed to be practicable given the steep slopes at the site. However, because the steep slopes will not be capped under the modified remedy, the use of a synthetic liner has been determined to be appropriate. In particular, the constructed caps will include a 30 mil (e.g., polyvinyl chloride) to 40 mil (e.g., polyethylene) impermeable synthetic liner.

Since the synthetic liner has advantages in terms of ease of installation, lower cost, and less weight, the modified cap will utilize a liner instead of the two feet of clay. The cap to be installed at the site will include 6 to 12 inches of soil suitable for membrane construction; a 30 to 40 mil impermeable synthetic liner; a minimum of 18 inches of cushion soil for drainage, including drainage piping as appropriate; a geotextile

separation layer, if necessary to prevent clogging of the drainage layer or to maintain separation of any layer; a minimum of 6 inches of topsoil suitable for vegetation; and the establishment of vegetative cover.

As part of the capping and covering efforts, surficial debris will be removed from all fill areas and appropriately disposed of prior to capping or covering. Further, any soils exhibiting a significant level of contamination (e.g., nickel-contaminated soil in an area of the Northwest-South Fill detected at concentrations ranging from 56,100 to 236,000 parts per million) which have been or are discovered at any of the fill areas will also be removed for appropriate off-site disposal.

Ground Water Extraction

Ground water extraction and treatment were included in the remedy selected in the 1986 ROD to minimize the potential for migration of the low levels of ground water contamination. As originally envisioned, the ground water extraction system was based on a series of perimeter ground water recovery wells to be constructed along a line parallel to the Rockaway and Whippany Rivers, bordering all five fill areas, and linked by a common trench along the pumping line. Additionally, the ROD recognized that the extracted ground water could be treated either on the site utilizing an air stripping system or at the adjacent Parsippany-Troy Hills wastewater treatment plant.

Information developed during the remedial design has indicated that a perimeter extraction system might not be as efficient as one utilizing more centrally located extraction wells, since the perimeter wells would likely withdraw a significant amount of river water in addition to ground water from beneath the fill areas. Therefore, the location of extraction wells will no longer be limited to the perimeter portions of the fill areas. Separate extraction systems will be installed in each of the five fill areas. In addition, the use of an on-site air stripping system is being retained as an option for treatment of extracted ground water along with the use of the Parsippany-Troy Hills wastewater treatment plant. If the Parsippany-Troy Hills wastewater treatment plant is used, it is anticipated that pretreatment of the extracted ground water will not be necessary. The Parsippany-Troy Hills wastewater treatment plant would be preferable since it could provide a more cost effective means of treatment than an on-site system, while providing a similar level of protection to human health and the environment.

A ground water monitoring program will be implemented at all five fill areas in addition to a surface water monitoring program for the Rockaway and Whippany Rivers. The purposes of the monitoring programs include assessing and monitoring ground water and surface water quality, determining the need for operation of the ground water extraction systems, and evaluating the effectiveness

of the extraction systems in establishing and maintaining hydraulic control.

Under the current scenario, a ground water extraction system will be installed in each of the five fill areas to provide hydraulic containment and prevent migration of contaminants out of each fill area when operating at design capacity. Once installed, the North Fill and South Fill systems will be operated continuously for a period of five years, regardless of the results of the ground water and surface water monitoring programs. The extraction systems at the other three fill areas will only be operated if monitoring results indicate such a need. After the initial five-year period, the need to operate the North and South Fill extraction systems will also be based on the results of the ground water and surface water monitoring programs.

The remedy selected in the 1986 ROD was estimated to have a cost of $26 million at that time. The cost estimate was subsequently revised in 1991, during the remedial design, to $64 million. The remedial approach described in this ESD is estimated to have a cost of approximately $36 million. This constitutes a significant savings of funds which can be used at other sites.

Support Agency Comments

The State of New Jersey supports EPA's revision to the remedy and decision to issue this ESD.

Affirmation of Statutory Determinations

Considering the new information that has been developed and the changes that have been made to the selected remedy, EPA and NJDEPE believe that the remedy remains protective of human health and the environment, complies with federal and state requirements that were identified in the ROD and this ESD as applicable or relevant and appropriate to this remedial action, and is cost effective. In addition, the revised remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site.

Public Participation Activities

In accordance with the NCP, a formal public comment period is not required when issuing an ESD. However, EPA will announce the availability of the ESD in The Star-Ledger. The ESD has been placed in the Administrative Record for the site.

William J. Muszynski, P.E.
Acting Regional Administrator

9/4/93
Date